

Application No. 10/069,912
Filed: February 28, 2002
TC Art Unit: 1754
Confirmation No.: 7091

REMARKS

Claims 1-17 are pending in the present application. Claims 11-17 are cancelled herein, without prejudice. Claims 1-10 are amended herein. New claim 18 is added herein. Accordingly, claims 1-10 and 18 will be pending upon entry of the instant amendments.

Support for the amended claims can be found throughout the specification and encompassed by the scope of the claims as originally filed. In particular, the amendment to the claims was made to more clearly define the present invention and in response to the claim objections and rejections under 35 U.S.C. §112, second paragraph. Support for the new claim 18 can be found, at least, for example, starting on the bottom paragraph of page 4, line 32, to the top of page 23, line 6. No new matter has been added.

Any amendments to the claims should in no way be construed as acquiescence to any of the Examiner's rejections and were done solely to expedite the prosecution of the application. Applicant reserves the right to pursue the claims as originally filed in this or a separate application(s).

Claim Objections

Claims 1, 6-10 and 14-17 were objected to for various informalities. Applicants have appropriately amended the claims in response to the Examiner's comments thereby correcting the informalities.

Claims 8 and 10 were objected to under 37 C.F.R. §1.75 as being a substantial duplicate of claims 7 and 9. Applicants submit that claims 7 and 8 and claims 9 and 10 are not duplicates.

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The methods steps, in the order of practicing the method steps, are distinguishable in that while claims 7 and 8 limit the method steps to Cr already contained in a steel material, claim 7 differs from claim 8 by forming a Cr oxide layer prior to the manufacturing of a fuel reformer vessel and after when a fuel reformer vessel is manufactured, respectively. While both claims 9 and 10 limit the method steps to steel with a separate thin film layer of Cr, similarly, claim 9 differs from claim 10 by forming a Cr oxide layer prior to the manufacturing of a fuel reformer vessel and after when a fuel reformer vessel is manufactured, respectively.

Claim Rejections - 35 U.S.C. §112

Claims 1-17 are rejected under 35 U.S.C. §112, second paragraph, as being indefinite. The Examiner argues that "a fuel reformer" can be "an apparatus," "a system," or "a device," such that the fuel reformer is not clearly defined and considered vague and indefinite.

Applicants have appropriately amended the claims to clearly recite a fuel reformer vessel thereby overcoming the rejection.

Claim Rejections - 35 U.S.C. §102(b)

Claims 1-5, 7-8 and 11-13 are rejected under 35 U.S.C. §102(b) as being anticipated by Chart et al., U.S. Patent 3,923,696).

Claims 11-13 have been cancelled herein thereby rendering the rejection with respect to these claims moot. With respect to the remaining rejected claims, Applicants respectfully traverse the foregoing rejection.

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It is well established that for a prior art reference to anticipate a claimed invention under 35 U.S.C. §102, the prior art must teach each and every element of the claimed invention. Chart et al. fails to anticipate each and every element of the claimed invention. Chart et al. is directed to a catalyst structure that comprises a metallic substrate, a catalytic outer surface and a layer of chromium oxide interposed therebetween to inhibit reaction between exhaust gas components and the metallic base. Exemplary exhaust gas components in Chart et al. includes oxygen, nitrogen, NOX and carbonaceous products produced, for example, by incomplete combustion of hydrocarbon fuels (Chart et al., column 2, lines 31-39). Also shown in Example I (Chart et al., column 4, lines 21-33), a catalyst coating is plated on the substrate, rendering the structure as a catalyst.

The present invention is distinguishable from Chart et al. because the present invention is directed to a reformer vessel that houses a catalyst whereas Chart et al. is to the catalyst. In the present invention, a fuel reformer vessel contains a chromium oxide layer on at least a part of a surface of a steel material where the steel material is exposed under an oxidative atmosphere by water vapor, for example, by a mixture of gas of hydrocarbon fuel gas and water (water vapor). In Chart et al., the atmosphere in which the catalyst is being used, for example, by an automotive exhaust gas (Chart et al., column 1, lines 9-15). Chart et al. fails to disclose, or even suggest, the problems associated (or any solutions) with using steel material reformers that are exposed to an atmosphere of low oxygen concentration and/or high water vapor concentration under a high temperature. To prevent red scaling which typically occurs in steel reformers,

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the present invention solves this problem by forming a chromium oxide layer on at least a part of the surface of the steel material of the reformer vessel. Chart et al. describes a catalyst itself where it suggests that it would be highly advantageous to produce a catalyst layer by electroplating one or more metals into the chromium layer.

Moreover, Chart et al. fails to anticipate the manufacturing method of a fuel reformer vessel as claimed in claims 7 and 8. Chart et al. is silent with regard to making a reformer vessel optimized to hold a catalyst in the combined method steps. Chart et al. is plainly distinguishable from the present invention and fails to anticipate each and every element of the claimed invention.

Claim Rejections - 35 U.S.C. §103

Claims 6, 9-10 and 14-17 are rejected under 35 U.S.C. §103(a) as being obvious over Chart et al.

Claims 14-17 have been cancelled herein thereby rendering the rejection with respect to these claims moot. With respect to the remaining rejected claims, Applicants respectfully traverse the foregoing rejection.

The independent claims as well as their respective dependent claims, e.g., claim 6, are considered allowable per the argument raised above addressing the reference Chart et al. As previously stated, Chart et al. cannot teach or suggest the claimed invention since the cited art is directed to a catalyst and not a reformer vessel for a catalyst. There is no teaching or suggestion in Chart et al. regarding the problems associated with steel

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reformers under an oxidizing atmosphere for an ordinary skilled artisan to come up with the claimed invention.

With respect to claims 9 and 10, while both claims 9 and 10 recite in their method steps that the steel is applied a thin film layer of Cr, claim 9 differs from claim 10 by forming a Cr oxide layer prior to the manufacturing of a fuel reformer vessel and after when a fuel reformer vessel is manufactured, respectively. While Chart et al. fails to teach or suggest a reformer vessel with the optimized conditions as claimed but also fails to teach or suggest the combined method steps as claimed. Accordingly, Applicants respectfully request reconsideration and withdrawal of the foregoing rejection.

CONCLUSION

Based on the foregoing, entry of the amendments and remarks presented herein, reconsideration and withdrawal of all the rejections and allowance of application with all pending claims are respectfully requested.

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The Examiner is encouraged to telephone the undersigned attorney to discuss any matter that would expedite allowance of the present application.

Respectfully submitted,

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